

**Listing of Claims:**

1. (Currently Amended) A transmission state indicating method for a predetermined transmission system, by SONET (Synchronous Optical Network)/SDH (Synchronous Digital Hierarchy), in which high capacity data is divided into a plurality of low capacity virtual containers and transmitted via a plurality of channels which configure a communication network by the SONET/SDH based on clocks at the respective channels, the method comprising:

acquiring a multiplexed frame in which mapping, accompanying delay absorption processings corresponding to transmission states at the respective channels, has been carried out based on a reference clock with respect to virtual containers at the respective channels included in a plurality of frames including the plurality of low capacity virtual containers;

successively detecting factors at the respective channels which are respectively included in the plurality of frames included in the multiplexed frame, and which are to be objects for delay absorption processings corresponding to the transmission states at the respective channels, as a plurality of pointer values ~~for respectively evaluating the transmission states~~ indicating a variation in phase or transmission delay

during transmission at said plurality of channels which configure the communication network by the SONET/SDH;

successively correcting the plurality of pointer values  
25 based on variations in phases at the respective channels which are detected from phase differences between the clocks at the respective channels and the reference clock; and

indicating the plurality of pointer values successively corrected, at the same time, corresponding to the plurality of  
30 channels.

2. (Original) The transmission state indicating method according to claim 1, further comprising:

storing said plurality of pointer values in association with information for indicating said plurality of pointer values at  
5 the same time in accordance with said plurality of channels; and

reading out the plurality of pointer values stored in association with the information for indicating the plurality of pointer values corresponding to the plurality of channels, at the same time.

3. (Original) The transmission state indicating method according to claim 1, further comprising:

carrying out processing for indicating said plurality of pointer values by relative values with respect to a pointer value

5 of a reference channel to be a reference among said plurality of channels when said plurality of pointer values are indicated at the same time corresponding to the plurality of channels.

4. (Currently Amended) The transmission state indicating method according to claim 1, wherein ~~, when the predetermined transmission system is an SDH (Synchronous Digital Hierarchy) system,~~ the plurality of pointer values include, as factors of  
5 the respective channels to be objects for the delay absorption processings, values of AU (Administrative Unit) pointers included in H1 bytes and H2 bytes which have been defined to show head portions of the virtual containers in case where the low capacity containers are contained in a payload, at the 4<sup>th</sup> row of an SOH  
10 (Section Overhead) frame in which the plurality of frames are frames of an STM (Synchronous transfer mode) and which is added to the payload of the frame of the STM.

5. (Currently Amended) The transmission state indicating method according to claim 1, wherein ~~, when the predetermined transmission system is an SDH (Synchronous Digital Hierarchy) system,~~ the plurality of pointer values include, as factors of  
5 the respective channels to be objects for the delay absorption processings, a value of H4 byte which has been defined at the 6<sup>th</sup> row of a POH (Pass Overhead) added to head portions of the

respective virtual containers in case where said plurality of frames are frames of an STM (Synchronous transfer mode) and the virtual containers included in the frames of the STM are a VC-3 format or a VC-4 format.

6. (Currently Amended) The transmission state indicating method according to claim 1, wherein ~~, when the predetermined transmission system is an SDH (Synchronous Digital Hierarchy) system,~~ the plurality of pointer values include, as factors of the respective channels to be the objects for the delay absorption processings, values of AU (Administrative Unit) pointers included in H1 bytes and H2 bytes which have been defined to show head portions of the virtual containers in case where the low capacity containers are contained in a payload, at the 4<sup>th</sup> row of an SOH (Section Overhead) frame in which said plurality of frames are frames of an STM (Synchronous transfer mode) and which is added to the payload of the frame of the STM, and a value of H4 byte which has been defined at the 6<sup>th</sup> row of a POH (Pass Overhead) added to the head portions of the respective virtual containers in case where said plurality of frames are frames of the STM (Synchronous transfer mode) and the virtual containers included in the frames of the STM are a VC-3 format or a VC-4 format.

7. (Original) The transmission state indicating method according to claim 1, further comprising:

converting the multiplexed frame on which mapping has been carried out into a concatenation mapping frame according to the rules of concatenation mapping; and

detecting a plurality of index values included in the concatenation mapping frame converted according to rules of the concatenation mapping in place of the multiplexed frame on which mapping has been carried out.

8. (Currently Amended) A transmission state indicating apparatus for a predetermined transmission system by SONET (Synchronous Optical Network)/SDH (Synchronous Digital Hierarchy), in which high capacity data is divided into a plurality of low capacity virtual containers and transmitted via a plurality of channels which configure a communication network by the SONET/SDH based on clocks at the respective channels, the apparatus comprising:

a multiplexed frame acquiring unit which acquires a multiplexed frame in which mapping, accompanying delay absorption processings corresponding to transmission states at the respective channels, has been carried out based on a reference clock with respect to the virtual containers at the respective

channels included in a plurality of frames including said  
15 plurality of low capacity virtual containers;

a pointer value detecting unit which successively detects  
factors at the respective channels which are respectively  
included in the plurality of channels included in the multiplexed  
frame acquired by the multiplexed frame acquiring unit, and which  
20 are to be objects for delay absorption processings corresponding  
to the transmission states at the respective channels, as a  
plurality of pointer values ~~for respectively evaluating the~~  
~~transmission states~~ indicating a variation in phase or  
transmission delay during transmission at the plurality of  
25 channels which configure the communication network by the  
SONET/SDH, and which successively corrects the plurality of  
pointer values based on variations in phases at the respective  
channels to be detected from phase differences between the clocks  
at the respective channels and the reference clock; and

30 a display unit which indicates the plurality of pointer  
values successively detected and corrected by the pointer value  
detecting unit, at the same time, corresponding to the plurality  
of channels.

9. (Original) The transmission state indicating apparatus  
according to claim 8, further comprising:

a storage unit which stores said plurality of pointer values successively detected and corrected by the pointer value  
5 detecting unit in association with information for indicating the plurality of pointer values at the same time in accordance with the plurality of channels; and

a control unit which reads said plurality of pointer values stored in association with the information for indicating said  
10 plurality of pointer values corresponding to the plurality of channels at the storage unit, at the same time.

10. (Original) The transmission state indicating apparatus according to claim 8, further comprising:

a control unit which carries out processing for indicating the plurality of pointer values successively detected and  
5 corrected by the pointer value detecting unit, by relative values with respect to a pointer value of a reference channel to be a reference among the plurality of channels in the case where said plurality of pointer values are indicated at the same time corresponding to the said plurality of channels.

11. (Currently Amended) The transmission state indicating apparatus according to claim 8, wherein ~~, when the predetermined transmission system is an SDH (Synchronous Digital Hierarchy) system,~~ the plurality of pointer values include, as factors of

5 the respective channels to be objects for the delay absorption  
processings, values of AU (Administrative Unit) pointers included  
in H1 bytes and H2 bytes which have been defined to show head  
portions of the virtual containers in case where the low capacity  
containers are contained in a payload, at the 4<sup>th</sup> row of an SOH  
10 (Section Overhead) frame in which the plurality of frames are  
frames of an STM (Synchronous transfer mode) and are added to  
payloads of the frames of the STM.

12. (Currently Amended) The transmission state indicating  
apparatus according to claim 8, wherein ~~, when the predetermined  
transmission system is an SDH (Synchronous Digital Hierarchy)  
system,~~ the plurality of pointer values include, as factors of  
5 the respective channels to be objects for the delay absorption  
processings, a value of H4 byte which has been defined at the 6<sup>th</sup>  
row of a POH (Pass Overhead) added to head portions of the  
respective virtual containers in case where the plurality of  
frames are frames of an STM (Synchronous transfer mode) and the  
10 virtual containers included in the frames of the STM system are a  
VC-3 format or a VC-4 format.

13. (Currently Amended) The transmission state indicating  
apparatus according to claim 8, wherein ~~, when the predetermined  
transmission system is an SDH (Synchronous Digital Hierarchy)~~



~~system,~~ the plurality of pointer values include, as factors of  
5 the respective channels to be objects for the delay absorption  
processings, values of AU (Administrative Unit) pointers included  
in H1 bytes and H2 bytes which have been defined to show head  
portions of the virtual containers in case where the low capacity  
containers are contained in a payload, at the 4<sup>th</sup> row of an SOH  
10 (Section Overhead) frame in which said plurality of frames are  
frames of an STM (Synchronous transfer mode) and are added to the  
payload of the frame of the STM, and a value of H4 byte which has  
been defined at the 6<sup>th</sup> row of a POH (Pass Overhead) added to the  
head portions of the respective virtual containers when the  
15 plurality of frames are frames of the STM (Synchronous transfer  
mode) and the virtual containers included in the frames of the  
STM are a VC-3 format or a VC-4 format.

14. (Original) The transmission state indicating apparatus  
according to claim 8, further comprising:

a frame converting unit which converts the multiplexed frame  
acquired by the multiplexed frame acquiring unit into a  
5 concatenation mapping frame according to the rules of  
concatenation mapping; and

an index value detecting unit which detects a plurality of  
index values included in the concatenation mapping frame

converted according to rules of the concatenation mapping by the  
10 frame converting unit.

15. (Currently Amended) A transmission state indicating  
apparatus for a predetermined transmission system by SONET  
(synchronous Optical Network)/SDH (synchronous digital  
Hierarchy), in which high capacity data is divided into a  
5 plurality of low capacity virtual containers and transmitted via  
a plurality of channels which configure a communication network  
by the SONET/SDH based on clocks at the respective channels, the  
apparatus comprising:

a plurality of clock reproducing units which reproduce  
10 clocks of the respective channels from reception signals of a  
plurality of frames including the plurality of low capacity  
virtual containers;

a plurality of frame receiving units which receive the  
plurality of frames including the plurality of low capacity  
15 virtual containers in which the high capacity data is divided  
into the plurality of low capacity virtual containers and  
transmitted via the plurality of channels which configure the  
communication network by the SONET/SDH, corresponding to the  
plurality of the respective channels, and detect the virtual  
20 containers at the respective channels based on the clocks of the

respective channels reproduced by the plurality of clock reproducing units;

a reference clock generating unit which generates a reference clock;

25 a frame assembling unit which carries out mapping with respect to the virtual containers at the respective channels included in the plurality of the frames received corresponding to the plurality of channels by the plurality of frame receiving units, based on the reference clock from the reference clock  
30 generating unit, accompanying delay absorption processings corresponding to the transmission states of the respective channels, so as to be produce a multiplexed frame;

a pointer value detecting unit which successively detects factors at the respective channels which are respectively  
35 included in the plurality of frames included in the multiplexed frame on which mapping has been carried out by the frame assembling unit, and which are to be objects for delay absorption processings corresponding to the transmission states at the respective channels, as a plurality of pointer values ~~for~~  
40 ~~respectively evaluating transmission states~~ indicating a variation in phase or transmission delay during the transmission at the plurality of channels which configure the communication network by the SONET/SDH, and successively corrects the plurality of pointer values based on variations in phases at the respective

45 channels to be detected from phase differences between the clocks  
at the respective channels reproduced by the plurality of clock  
reproducing units and the reference clock generated by the  
reference clock generating unit;

an information storage unit which stores the plurality of  
50 pointer values successively detected and corrected by the pointer  
value detecting unit in association with information for  
indicating the plurality of pointer values in accordance with the  
plurality of channels; and

a display unit which indicates, at the same time, the  
55 plurality of pointer values for respectively evaluating the  
transmission states of the plurality of channels which configure  
the communication network by the SONET/SDH, corresponding to the  
plurality of channels, based on the plurality of pointer values  
and the information for indicating the plurality of pointer  
60 values corresponding to the plurality of channels which have been  
stored in association with one another in the information storage  
unit.

16. (Original) The transmission state indicating apparatus  
according to claim 15, further comprising:

a control unit which carries out processing for indicating  
the plurality of pointer values by relative values with respect

5 to a pointer value of a reference channel to be a reference among  
the plurality of channels on the display unit.

17. (Currently Amended) The transmission state indicating  
apparatus according to claim 15, wherein ~~, when the predetermined  
transmission system is an SDH (Synchronous Digital Hierarchy)  
system,~~ the plurality of pointer values include, as factors of  
5 the respective channels to be objects for the delay absorption  
processings, values of AU (Administrative Unit) pointers included  
in H1 bytes and H2 bytes which have been defined to show head  
portions of the virtual containers in case where the low capacity  
containers are contained in a payload, at the 4<sup>th</sup> row of an SOH  
10 (Section Overhead) frame in which the plurality of frames are  
frames of an STM (Synchronous transfer mode) and are added to the  
payload of the frame of the STM.

18. (Currently Amended) The transmission state indicating  
apparatus according to claim 15, wherein ~~, when the predetermined  
transmission system is an SDH (Synchronous Digital Hierarchy)  
system,~~ the plurality of pointer values include, as factors of  
5 the respective channels to be objects for the delay absorption  
processings, a value of H4 byte which has been defined at the 6<sup>th</sup>  
row of a POH (Pass Overhead) added to head portions of the  
respective virtual containers in case where the plurality of

frames are frames of an STM (Synchronous transfer mode) and the  
10 virtual containers included in the frames of the STM are a VC-3  
format or a VC-4 format.

19. (Currently Amended) The transmission state indicating  
apparatus according to claim 15, wherein ~~, when the predetermined  
transmission system is an SDH (Synchronous Digital Hierarchy)  
system,~~ the plurality of pointer values include, as factors of  
5 the respective channels to be objects for the delay absorption  
processings, values of AU (Administrative Unit) pointers included  
in H1 bytes and H2 bytes which have been defined to show head  
portions of the virtual containers in case where the low capacity  
containers are contained in a payload, at the 4<sup>th</sup> row of an SOH  
10 (Section Overhead) frame in which the plurality of frames are  
frames of an STM (Synchronous transfer mode) and are added to the  
payload of the frame of the STM, and a value of H4 byte which has  
been defined at the 6<sup>th</sup> row of a POH (Pass Overhead) added to the  
head portions of the respective virtual containers in case where  
15 said plurality of frames are frames of the STM (Synchronous  
transfer mode) and the virtual containers included in the frames  
of the STM are a VC-3 format or a VC-4 format.

20. (Original) The transmission state indicating apparatus  
according to claim 15, further comprising:

a frame converting unit which converts the multiplexed frame  
on which mapping has been carried out by the frame assembling  
5 unit into a concatenation mapping frame according to rules of  
concatenation mapping; and

an index value detecting unit which detects a plurality of  
index values included in the concatenation mapping frame  
converted according to the rules of the concatenation mapping by  
the frame converting unit.